



Course Title: Compilers and Languages

Date: 25.10.2016 (First term)

Course Code: CCE3113 3rd year

Allowed time: 30 minutes

Answer the following questions:

1. Which of the following regular expressions exactly equivalent?Explain (4 marks)

- a) $x?x^*$ x^* ✓
 b) a^*b^* $(ab)^*$ no
 c) $(P+Q+\epsilon)^*$ $(P+Q)^*$ ✓
 d) $(0|1)?$ $0?|1?$ ✓

$$y_1 = ax_1 + C$$

$$y = ax + C$$

$$\frac{dy}{dx} = a = \checkmark$$

$$= \text{slope} \cdot x + (y_1 - a x_1)$$

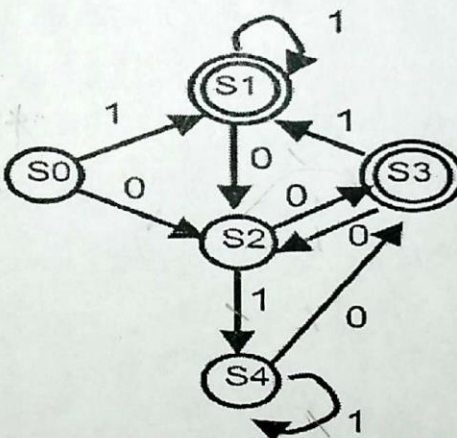
2. Write a regular expression for the following languages.

(2 marks)

- a) All strings of a's and b's which contains an odd number of a's.
 b) All strings of a's and b's that contain no three consecutive b's.

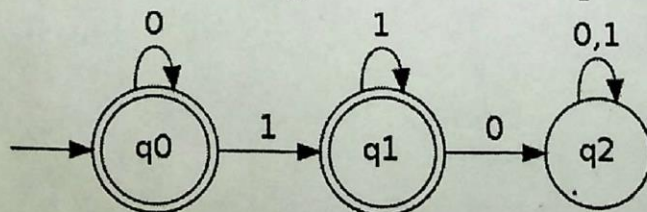
3. Write a regular expression for the following automata.

(2 marks)



4. Consider the following DFA over the alphabet $\Sigma = \{0, 1\}$.

(2 marks)



- i. Give a one-sentence description of the language recognized by the DFA.
 ii. Write a regular expression for this language.

Best wishes

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